

FOURTH GENERATION ELECTRONIC MASS COMMUNICATIONS MEDIA

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A small number of ideas or metaphors seem to have guided our thinking about how computers might be used.

1. Computers have for years been used as "calculators" for data manipulation, simulation, accounting and information retrieval.¹

2. Efforts to develop "teaching computers" have been very effective at least at the University of Illinois in producing significant advances in hardware, and software and applications. But most of the people involved in educational technology tend to view themselves as developing new devices for existing institutions rather than as possibly bringing about fundamental changes in schools and in other institutions as well.

3. The "information utility" concept was written about considerably by computer professionals beginning in the late 1960's and provided the route whereby they began to consider more imaginative social applications of computers.²

4. The small number of articles on "computer-based communications media" usually proceed in one of two directions.

a. The most well developed idea so far is the computer as a communications medium among experts or professionals. J.C.R. Licklider produced an article on the computer as a communication device in 1968.³ Murray Turoff's work with Delphi Conferencing has also focused on communication among professionals.⁴

b. The computer as a communications medium for the public at large is an idea that could have a significant impact on current democratic theory.⁵ But before getting into the complexities of that debate, perhaps it would be wise to clarify how

computer-based communications media differ from other electronic mass communications systems.

Generations of Communications Media

During the next four to five years, the PLATO system at the University of Illinois is scheduled to expand from the simultaneous operation of 20 terminals to the simultaneous operation of 4000 terminals.⁶ Although the PLATO system has been designed primarily as an educational device, it might also be viewed as a new kind of mass communications system--the prototype of fourth generation electronic mass communications media.

Communications media can be thought of in "generations" just as computers are.

1. Radio transmits audio messages from the center to the periphery.

2. Television transmits audio and visual messages from the center to the periphery.

3. Cable television provides a great increase in the number of available channels and the possibility of both passive feedback (monitoring what people watch) and active feedback (for example, voting by pressing a button on the television set).

4. Computer-based communications systems have several new characteristics.

a. Less simultaneity: Although many people may be using the program, each may be in a different part of the program. Thus everyone on one "channel" does not see the same thing at the same time.

b. Less evanescence: With radio and television a listener or viewer cannot go back if he misses a word or sentence (unless he has a tape recorder).

With PLATO each individual progresses at his own rate. The display does not change until he wants it to, and he can go back to review previous displays.

An elementary version of an "exploration of alternative futures" is already in operation at the Computer-based Education Research Laboratory on the University of Illinois campus. This "exploration" was originally proposed by Professor Charles E. Osgood as a device for education and social science research.⁸ It is now regarded as the forerunner of "citizen sampling simulations," which would use the physical equipment of the teaching computer to exchange information and opinions between experts and a cross-section of the public. The medium and long-range consequences of alternative courses of action would be "simulated" and responses obtained from a "sample" of the population. The results, which would indicate what the public considers to be desirable or undesirable policies, would then be submitted to planning personnel for their consideration. A preliminary experiment, using a local environmental issue, has been conducted by Valarie Lamont.⁹

Why New Forms of Participation are Needed

Two justifications can be given for involving more people in the decision-making process. First, there has been a marked increase in long-range planning activity in the United States and other nations in recent years. Several developments -- the establishment of new institutes, the founding of new journals, and the sharp increase in the number of books concerned with the future-- attest to the emergence of a new field of activity in many institutions and particularly in industry, government, and universities.¹⁰

The increase in planning has resulted in part from the effort to deal with interrelated problems. For example, Patrick Moynihan contends that few federal officials display a sensitivity to "hidden" urban policies."

They are, to their minds, simply building highways, guaranteeing mortgages, advancing agriculture or whatever. No one has made clear to them that they are simultaneously redistributing employment opportunities, segregating or desegregating neighborhoods, depopulating

and 1848 the steamship, railroad, new printing techniques and the telegraph produced stunning changes in the way individuals saw themselves and their positions in society... In both Europe and the United States the telegraph did more than simply raise the quantity of information. It placed knowledge in new places under changed conditions. It bypassed traditional systems for controlling information.¹²

With regard to the present and future situation

Paul Baran has written,

"The flood of news flowing downward and the felt lack of an upward channel of reply can be expected to worsen in the near term... Failure to supply such a channel would appear to guarantee alienation from the political process... There is a strong emotional need for the feedback channel in most 'electrical communications crowds' to allow people to interact with something."¹³

The political turmoil in the United States in the late 1960's was no doubt primarily due to growing dissatisfaction with the Viet Nam war and the just demands of minority groups and women. But an important factor in the political climate was the greatly increased ease in transmitting information about social problems. This change was not offset by a proportionate change in the public's ability to influence social policy either through an increase in the political skill of the electorate, or through changes in institutions, or both. Radical reformers claim that basic changes in institutions are necessary whereas Common Cause, the citizen's lobby organized by John Gardner, seems to believe that better use of existing structures will suffice. The above interpretation, that a balance is necessary between the information going to the people and the opportunities for participation in public decision-making, tends to support the radical position.

c. The Institute for Policy Studies in Washington, D.C. is using simulations of social situations to involve particular groups of the population in thinking about planning.¹⁷ No electronic technology is involved.

d. The Advocates on the public broadcasting channel is the present activity which most closely approaches public discussions of national goals. The program obtains feedback from people in the studio using hand-held consoles and from viewers by mail.

e. Radio talk shows which allow listeners to call in and make comments or ask questions have now become common across the country. In addition, an increasing number of radio and television stations are beginning to cover city council and school board meetings. In Jacksonville, Florida, the public TV station accepts telephone calls following a nightly program "Feedback" which reports through film, videotape, and live interviews on issues in the news that day. The program has launched a clean-up campaign, forced the closing of a ramshackle junior high school and prompted a mosquito control campaign. The station also engages in "turnabout" television--when someone "has a valid point to get through to an official body, the public affairs staff of the station will make a film or videotape presentation illustrating it...Significantly, such programs attract viewers comparable to the audiences drawn to pure entertainment."¹⁸

In order to find out how present feedback mechanisms in local government work, Ezra Krendel did a study of citizen complaints and government responsiveness in Philadelphia.¹⁹

The suggestion made earlier of public participation simulations using computer-based communications media will obviously not be possible until the hardware and software are available. Present projections suggest that the

the publication of The Pentagon Papers, has greatly diminished confidence in the liberal elites. Furthermore, Robert Cirino's unique and very useful book, Don't Blame the People, describes in detail how balanced and responsible reporting fails to occur in the mass media.²³

Nevertheless the pluralist school of democratic theory is still very strong and can be expected to be the major source of opposition to increased public participation in decision-making whether in day-to-day decision-making or in setting long-range goals. Bachrach quotes Dahl, a leading pluralist spokesman, as having written, "It goes without saying that except in exceedingly small groups, specific decisions must be made by a relatively few people acting in the name of the polity."²⁴ Further describing the position of the pluralist school Bachrach writes:

To continue to advocate (democratic) theory in today's world, it is argued, is bound to foster cynicism toward democracy as it becomes evident that the gap between the reality and the idea cannot be closed. Thus it is said that there is no alternative but to recast democracy, emphasizing the stable, constitutional, and liberal nature of the system of elite pluralism; the competitiveness of political elites, their accountability to the electorate at periodic elections; and the open, multiple points of access to elite power for those who bother to organize to voice their grievances and demands. In this view elites become the core of democratic, or if one prefers, polyarchical theory. To be sure, the ordinary man still plays a role in the system since he has the freedom to vote, to bring pressure upon political elites, and to attempt himself to rise to an elite position. But by and large he does, and is expected to, remain relatively passive--in fact the health of the system depends upon it. For if he becomes too active, too aroused in politics, awakening the alienated, the apathetic masses of the cities and the rednecks of rural communities, political equilibrium is thrown out of balance and the demagogue finds greater opportunity to challenge successfully the power of established elites.²⁵

The growing availability of cable television calls into question the original assumption about what is technically possible. And the probable future availability

prepare a preliminary program which would be expanded and modified by later participants. If used in this way the computer would not be acting as a communications medium between planners and the public but rather as a communications device linking up the more active citizenry. If indeed "the attentive public" is expanding due to increased education, greater leisure time and improved communications, it would seem desirable to try to devise mechanisms whereby more people could be involved in the political process on non-trivial tasks.

But despite the assertion regarding what is possible, it is clear that the emotional core of the pluralist argument lies in what they believe is desirable.

One way of stating the objection to increasing public participation in decision-making is that the amount of information or expertise going into public decisions would decrease. There is a significant group of people, not just political scientists but largely those with professional training, who believe that the amount of expertise in decision-making should increase, not decrease. The debate might be thought of as a modern version of the debate between Alexander Hamilton and Thomas Jefferson in the early days of the republic. Hamilton argued in favor of expertise in public administration. Jefferson spoke for democratic participation.

Some of those opposed to greater public participation in decision-making display a preoccupation with making "better" decisions by which they usually mean that a forecast was made of relevant aspects of the future environment of the decision or policy, that as wide as possible a range of alternatives was drawn up and that possible secondary and tertiary effects of each alternative were considered. What they tend to neglect is that there are basically two ways of improving the performance of a complex system. One can either improve the forecasting capability of a system, thus reducing the need to take quick corrective

prepare the programs. Any communications medium should be restrained by a system of checks and balances and possibly an appeals system to resolve the inevitable disputes over how to use the system. With regard to the use of a computer-based communications medium in a local community, the following procedures are suggested as a starting point for further discussion.

1. At the end of an exploration of a particular topic, each respondent at a terminal should be asked to indicate the issues which he or she would like to have discussed the next time. Of course there should be the opportunity to suggest topics not already on the list.
2. The order of priority of issues would then presumably be decided by some elected body or governing board that would have to decide for which issues there is adequate background material and which issues would require additional fact-finding.
3. After the programming is completed in the first draft form, the elected body or its representatives and other individuals particularly concerned with the issue being presented should be allowed to view the program and suggest modifications. Frequently consensus will permit modifications in wording to be made with minimum formal procedure. But cases of dispute could be decided by a committee of the city council or the council itself.
4. Presumably an issue would be presented to the public several times so that public responses and suggestions could also be used to improve the program. In cases when a person makes a suggestion which he does not see incorporated in the next version of the program, he should be able to appeal the decision of the programmer to some other group, possibly a committee of the city council. Such a procedure would help to ensure that imaginative ideas or ideas about which one person or a small group feel very strongly will be presented in the exploration.
5. Other media such as radio, television, and

a few messages to a multitude of recipients, with a resulting influence toward homogeneity and conformity. The new technology will tend to substitute for the mass media an interactive medium that, by adjusting to each user's desires, could introduce into society a powerful force toward fragmentation and variety.³⁰

However, a mass communications system with built-in feedback, by allowing people to comment on the information presented (and not presented), could be used to compare and contrast the different viewpoints developed on the special audience channels. This application of computer-based mass communications media as opposed to the information utility notion might help hold society together. Such a medium could be thought of as a forum where divergent views are brought together,

The Design of Societies

There is one last way in which the computer can contribute to an understanding of human communication. The design of a computer can be thought of as an analogy for designing a social system since each is primarily an information processing apparatus. Just as control units, arithmetic and logic units and memory units are rearranged and duplicated in order to perform certain operations better, so new feedback channels or new organizations or new investigating groups can be created to change the kind of operations a society can perform well or, in more familiar terms, to change the distribution of power.³¹

Of the many theories of social systems already developed, very few are useful in redesigning social structures in order to alter their performance. In my judgment the most useful literature for this kind of activity is that which has been developed under the titles of cybernetics, general systems theory, information theory and communication theory.³²

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24. Bachrach, Op. Cit., p. 86.

25. Bachrach, Op. Cit., p. 8.

26. Examples of the different points of view appeared in the March-April 1971 issue of the Center Magazine: John Platt, "Science for Survival" and Carl Oglesby, "The Crisis Is Political."

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28. Ithiel de Sola Pool, "Social Trends," International Science and Technology, a special issue on the Communications Revolution, April 1968, pp. 87-101.

29. Ibid., p. 88.

30. Ibid., p. 87.

31. For an example see: Stuart Umpleby, "An Information Theory Approach to the Control of Economic Systems," Computer-based Education Research Laboratory, University of Illinois, Urbana, October, 1970.

32. Useful texts include: W. Ross Ashby, An Introduction to Cybernetics, John Wiley and Sons, 1956. Ludwig von Bertalanffy, General System Theory: Foundations, Development, Applications, George Braziller, 1968. J.R. Pierce, Symbols, Signals and Noise: The Nature and Process of Communication, Harper Torchbooks, 1961.